How Price Tags Affect Willingness-To-Pay

---Evidence from the Field (and Lab)

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Abstract

We investigate how posted prices affect consumers' willingness-to-pay (WTP) for real-world products by eliciting the WTP from experienced consumers for water-resisting handbags and consumer electronics accessories before and after people see the price tag. To control for possible experimental artifacts, we elicit WTP with the following procedure: The incentive compatible Becker, DeGroot, Marschak (BDM) mechanism, explanations of the optimal strategy under BDM (truthfully revealing one's valuation), and paid practice rounds with subjects switching roles between buyers and sellers. Though this procedure has successfully minimized the willingness-to-pay and willingness-to accept gap in the literature (which we indeed replicate), we find a moderate but significant increase in WTP for the majority whose initial WTP were lower than the price tag, and a sharp decrease in WTP among the few whose initial WTP were higher than the price tag. This suggests a price effect driven by information regarding potential resale (and repurchase) opportunities. A similar laboratory experiment with college students replicates these findings. This suggests that when firms determine prices or discounts, they might have to care more about the negative "outside-opportunity" effect of low prices instead of the positive "price placebo" effect commonly observed in more controlled environments.

Keywords: Price Placebo Effect, Field Experiment, Consumer Behavior, Valuation, Field and Lab Parallelism

JEL codes: *M31, C93, L81, C91*

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1 Introduction

Price Placebo Effects are widely studied in marketing. Early attempts include Leavitt (1954), which showed that consumers preferred the more expensive brand while facing two unknown brands. Later, numerous studies have documented how posted prices affect self-reported perceptions of a product's quality (Rao and Monroe, 1989, provide a review). When it comes to actual consequences (instead of hypothetical questions), recent studies show that a high price tag can boost the performance in solving puzzles after consuming an energy drink (Shiv, Carmon and Ariely, 2005), reduce reported pain after taking a new pain-killing drug which is actually placebo (Waber, Shiv, Carmon and Ariely, 2008), and even increase brain activity (in addition to self-reported pleasure) when subjects taste red wine in an fMRI scanner (Plassmann, O'Doherty, Shiv and Rangel, 2008).

However, these results leave many questions unanswered. First of all, stated willingness-to-pay (SWTP) or perception surveys can be very inaccurate because answers to these inquiries have no real consequences. Subjects were not punished for misrepresenting their true WTP, nor were they rewarded for reporting it honestly.[1] Secondly, studies that do have real consequences focus on the effectiveness or pleasure derived from a product, instead of actual consumption choices. What is more, when one does measure actual choices, Heffetz and Shayo (2009) found the (non-budget-constraint)

[1] In fact, Wertenbroch and Skiera (2002) conduct a field experiment to compare SWTP with WTP elicited incentive compatibly, and found SWTP less reliable.

price effect is relatively small and insignificant in the lab (elasticity = 0.09~0.18) using candy bars, and find no effect in a field experiment altering restaurant menus (they altered the ala carte prices of each course while keeping combo prices the same). Finally, most of these studies focus on high vs. low prices, answering the big question marketers want to know, without investigating the more fundamental question scientific researchers care about, namely how posted prices affect the process whereby consumers form their valuation of a product.

In economic theory, consumer valuation is typically taken as given, and hence, not affected by posted prices. For example, in the simple Marshallian supply-demand model, consumers are assumed to know their valuations of any product, which is reflected in the demand curve. Accordingly, seeing the market price should not change one's valuation. Under asymmetric information, prices could serve as a sign for a good's quality (Scitovsky, 1945; Klein and Leffler, 1981; Wolinsky, 1983, Milgrom and Roberts, 1986; Bagwell and Riordan, 1991). But, in most of these models, the distribution of valuation for a particular product is still assumed to be common knowledge before pricing is considered, so posted prices affect not the intrinsic consumption value, but one's estimate of this value. One exception would be Ng (1987), which considered the possibility that some goods, such as diamonds, could be "valued for their values."

Despite the lack of theory, we do have some empirical evidence seeing the posted price does alter one's emotion toward the product, and thus, could affect valuation. For example, Knutson et al. (2007) showed that the brain produces a negative feeling as a response to excessive prices, and is reflected in activation in the insula (and deactivation

in the medial prefrontal cortex (mPFC) before the purchase decision).[2] Therefore, though the formation of one's valuation for a product and its relationship with the posted price is under-explored, new tools in experimental and neuro-economics are available (and should be employed) to address these issues.

Thus in this paper, we investigate how posted prices affect consumers' willingness-to-pay (WTP) for real-world products. In particular, we elicit consumers' WTP for water-resistant handbags and consumer electronics accessories (such as laptop sleeves or cell phone covers), before and after seeing the price tag. Since the focus is on actual purchasing behavior, we went to a department store in downtown Taipei, and recruited experienced consumers either at the check-out counter or from a VIP customer list (provided by the producer) to participate in our experiment, in which they would have a chance to actually purchase the items.

To elicit truthful WTPs and to control for possible experimental artifacts, we use the following procedure to elicit WTP: The incentive compatible Becker, DeGroot, Marschak (BDM) mechanism, which produces actual outcomes based on one's bid, explanations of the optimal strategy under BDM (truthfully bidding one's valuation), and paid practice rounds with subjects switching roles between buyers and sellers. The paid practice rounds consist of 14 lottery rounds, in which subjects bought or sold lotteries, and 6 product rounds, in which subjects bought or sold NTU souvenirs. Plott and Zeiler (2005) and Isoni, Loomes and Sugden (2010) showed that a similar procedure (round 1-15) could successfully minimize the willingness-to-pay and willingness-to-accept (WTP-WTA) gap in the literature (which we indeed replicate). In particular, after 14

[2] In contrast, there is a positive effect of seeing a favorite product which activates the nucleus accumbens (NAcc).

lottery rounds, they observed no gap in round 15 where subjects bought or sold a school mug.

Nevertheless, after sufficient training and paid practice, we still find a moderate but significant increase in WTP for the majority whose initial WTP were lower than the price tag, and a sharp decrease in WTP among the few whose initial WTP were higher than the price tag. The former result confirms the price placebo effect found in marketing experiments, and is consistent with the findings of Heffetz and Shayo (2009) that the non-budget constraint price effect is not large. However, the latter result is quite surprising and has not been previously reported. This suggests a price effect driven by information regarding potential resale (and repurchase) opportunities, which is conveyed through the price tag, instead of information about the product itself. This is consistent with recent studies of empirical "auctions with resale", such as Haile (2001) and Leslie and Sorensen (2010).

One might wonder if subjects indeed report WTP truthfully. Although we cannot verify whether their bids truly reflect their WTP, we do have some indirect evidence that subjects do report truthfully. In particular, we employed the same set of paid practice rounds as Plott and Zeiler (2005) and Isoni, Loomes and Sugden (2010). Results from our paid practice rounds are comparable to theirs, as the WTP-WTA gap vanishes for NTU souvenirs (mug, folder, etc.) after carefully controlling for experimental procedure and training subjects through 14 lottery rounds.[3]

A similar controlled laboratory experiment with college students replicate these findings. Only one item had an initial WTP (from one subject) higher than the price tag,

[3] We also replicate the results of Isoni, Loomes and Sugden (2010), as well as Plott and Zeiler (2005)'s training data, namely the WTA-WTP gap persists in the 14 lottery rounds.

though. In other words, our main findings are robust across subject pools, though college students typically have much lower WTP, likely due to lower income. In consequence, careful experimental procedures, such as those developed by Plott and Zeiler (2005), can be applied even to field settings and produce consistent experimental results both in the field and in the lab. This contributes to the small, but growing literature on lab and field parallelism fostered by Levitt and List (2007).

On the other hand, since college students have low WTP, and hence, are not representative of the pool of potential consumers retailers care about, results of marketing experiments that use student subjects, though genuine, may be far less important to actual marketers. This suggests that when firms determine prices or offer discounts, they might have to devote more consideration to the negative "outside-option" effect of low prices, instead of the positive "price placebo" effect commonly observed in more controlled environments, such as those reported in the marketing literature.

The remaining paper is structured as follows: Section 2 describes details of the experiment; Section 3 reports experimental results from the "real" rounds; Section 4 reports results from the paid practice rounds. Finally, Section 5 concludes.

2 Experimental Design

We conducted experiments both in the field and in the lab to elicit subjects' willingness-to-pay (WTP) for durable consumer products (water-resistant handbags, laptop sleeves, cell phone covers, and so on), before and after people see the price tag. Products from the sporting goods brand name, Knock, were used due to availability (one of the authors was able to contact the company that owns the brand and convinced them to allow us to use their products to conduct the experiment), and for its broad appeal to

both college students and ordinary people.

To avoid subject misconceptions and elicit true valuations, we implemented an incentive compatible elicitation device, the Becker, DeGroot, Marschak (BDM) mechanism. In the instructions, we provided explanations of the optimal strategy under BDM, namely truthfully revealing one's valuation. We also employed paid practice rounds with subjects switching roles between buyers and sellers in order to familiarize them with the BDM procedure. This procedure was employed by Plott and Zeiler (2005) to minimize the WTP-WTA gap.[4]

2.1 Field Setting

In the field, we invited actual consumers who had previous purchasing experience of the same product line to participate in our experiment. In particular, we contacted people on a list of VIP customers provided by the brand name owner; we also invited customers who just made a purchase at the Knock store.[5] During the course of the experiment (from Jan. 27 to Jan. 31, 2010), we successfully invited 26 actual costumers between the ages of 19 and 63, including 11 males and 15 females.

We ran our experiment in the Momo department store of downtown Taipei. This department store was chosen for three reasons: First, the brand name owner has an in-store counter here, and they convinced the department store to offer us a quiet and

[4] Note that Plott and Zeiler (2005) also included the condition of anonymity in their design. We could not incorporate the condition of anonymity in the field, since inviting actual costumers in the field required access to the VIP customer list of the brand name owner, and subjects knew they were contacted through this list. Also, subjects came in one-by-one, and we had to check their identities before the experiment, so it was not possible for us to achieve the condition of anonymity. However we avoided observing their choices and notified them that we would not check their choices during the experiment.

[5] The VIP customer list provided by the company consists of 100 people. 21 agreed to participate in our experiment. The remaining 5 subjects were invited on the spot. When inviting subjects on the spot, we waited nearby the KNOCK check-out counter, and approached those who just made a purchase and invited them to participate in the experiment. We believe this criterion makes them comparable to the people who were on the VIP customer list.

suitable corner to run our experiment. Secondly, this department store is relatively new (opened on Jan. 1, 2010, while our experiment was conducted at the last week of the opening month), so consumers had not form preconceived ideas about the style or price level for this department store. Third, this department store is located in downtown Taipei, so transportation would not be a problem for the subjects we invite.

Each experiment consisted of one paid practice session and one real-world consumer goods session. Before these two sessions, we first showed subjects all of the products used in the experiments and encouraged subjects to actually pick them up and take a close look. We included this demo session to make sure subjects had a chance to get familiar with all of the items (since several products were not on the market yet). Also, Bushong, King, Camerer and Rangel (2010) found that the physical presence of a good alters WTP. Hence, including a hands-on demo session closely replicates the field setting where subjects do have a chance to examine the products before purchase in person. We also taught subjects (via experiment instructions) that their best policies would be to report their true valuations.

2.2 Paid Practice Rounds (Replication of PZ)

The paid practice session included 14 lottery rounds and 6 NTU souvenir rounds. For the 14 lottery rounds, we replicated the Type A lotteries of Plott and Zeiler (2005), but multiplied the payoffs of the lotteries by 50 to convert into New Taiwan Dollars.[6] The lotteries were sequenced as follows: 3 small-stake lotteries to elicit willingness-to-accept (WTA), 3 small-stake lotteries to elicit WTP, 4 large-stake lotteries to elicit WTA, and 4 large-stake lotteries to elicit WTP.

[6] The exchange rate between USD and NTD is about 1:30. We multiplied the payoffs by 50 to guarantee subjects earned enough money to avoid potential bankruptcy problems if they later purchased an expensive item.

Following the 14 lottery rounds were 6 NTU souvenir rounds, which were sequenced as follows: mug, folder, travel mug, notebook, pencil case, and mouse pad set. We asked the odd numbered subjects[7] their WTA for the mug and folder, and their WTP for the rest. Furthermore, we ask the even number subjects their WTA for the travel mug and notebook, and their WTP for the rest.

After eliciting WTP (or WTA), the computer randomly selected a "computer price" from a range that was pre-determined by the experimenter.[8] In lottery rounds 1-3 and 7-10, if the subject's WTA was lower than the computer price, the subject would sell the lottery (to the experimenter) in that particular round, and receive the computer price as payoff. However, if the subject's WTA was higher than the computer price, the subject would keep the lottery and earn whatever the outcome of the lottery.

In contrast, in lottery rounds 4-6 and 11-14, if the subject's WTP was higher than the computer price, the subject would purchase the lottery and pay the computer price. Therefore his/ her payoff would be the lottery outcome minus the computer price. On the other hand, if the subject's WTP was lower than the computer price, the subject would not obtain the lottery, and his/ her payoff would be zero.

In the NTU souvenir rounds, similar to the lottery rounds, when subjects reported their WTA to be lower than the computer price, they would sell the item and earn the computer price. And if their WTA was higher than the computer price, they would keep the NTU souvenir in that round (i.e., s/he can actually bring the item home). And when

[7] Odd and even number subjects were assigned randomly by session.

[8] The computer price is determined by the following procedure: A minimum price (typically zero) and maximum price (varies by item) is first specified. Then, a coin toss determines whether the price would be above or below the expected value (EV) of the lottery (or market price of the item). Finally, the computer chooses a price uniformly in that range (minimum to EV or EV to maximum). However, subjects were only told the computer price was randomly drawn from a predetermined distribution that was unrelated to their stated WTP or WTA.

subjects reported their WTP to be higher than the computer price, they would receive the NTU souvenir and pay the computer price. If the subject's WTP was lower than the computer price, the subject could not purchase the NTU souvenir, and his/ her payoff would be zero.

Since these were paid practice rounds, every round was realized after subjects reported their WTA or WTP to make sure subjects had the chance to learn. The payoffs in the paid practice session were accumulated in NT dollars and could be spent in the next session. Therefore, subjects could use both the earnings in the paid practice section as well as the show-up fee to buy consumer goods in the next section. The show up fee in the field was NT$500 (roughly US$16.67), respectively.[9]

2.3 Real Rounds (Measuring Effect of Price Tag)

After the paid practice session, we conducted the real-world consumer goods session. We used 17 items in the Knock product line, their market prices ranging between NT$170 (roughly US$5.67) and NT$4,280 (roughly US$142.67). Among these items, 6 of them (having prices are between NT$1,880 and NT$4,280) were still not introduced to the market when we conducted the experiments, and therefore their market prices were the expected market prices provided by the brand name owner (which was communicated to subjects). There were a total of 38 rounds in this section. In the first 19 rounds, we did not show the market price of the items; in the next 19 rounds, we showed the items with their market price. We randomized the 17 items for the first 17 rounds, and then rounds 1 and 2 were repeated again as rounds 18 and 19. Similarly, another randomization of the

[9] In the rare case where a subject purchases an expensive item at a high price, s/he has to pay out-of-pocket to obtain that item. Subjects were all warned about this possibility and advised not to report a high WTP/WTA unless they really meant it. None of the subjects regretted or backed out of their purchasing decision.

17 items was used for round 20 through 36, and then rounds 20 and 21 were repeated as rounds 37 and 38.

In every round, subjects were shown the picture of the item in three different colors.[10] The purpose of showing subjects three different colors of the same item is to eliminate color preference bias. Subjects then reported their WTP for that item. After 38 rounds, we randomly selected one of the 38 rounds for the subject and played it out. That is, if the subject's WTP in that round was higher than the computer price, the subject would have to purchase the item at the computer price. If the subject's WTP was lower than the computer price, his/ her payoff would be zero.

2.4 Lab Replication

Since our field experiment described above could be viewed as "a conventional lab experiment with nonstandard subject pool and field context",[11] we also conducted the same experiment in the laboratory using college students subjects. We recruited 28 National Taiwan University (NTU) students between the ages of 19 and 23, including 17 males and 11 females, and ran a total of 6 sessions from Dec. 24 to Dec. 30, 2009 at Taiwan Social Science Experimental Laboratory (TASSEL) at National Taiwan University (NTU).

Nearly identical experiment procedures were used in both the lab and the field, though the show-up fee in the lab was NT$100 (roughly US$3.33).[12] This replication tests the robustness of our results and contributes to the small number of studies

[10] If they purchased the item, they could choose the color they like best.
[11] In fact, Harrison and List (2004) would classify our experiments as "framed field experiments."
[12] However, the lab experiment instructions were not exactly the same as the field instructions, since we used "neutral language" in the lab, but were forced to modify some of the wording in the field to reflect the context. For example, the term "lottery (樂透)" gave field subjects the idea of some form of gambling or even fraud. Hence, we had to replace it with the term "goodie bag (福袋)." (It is common for department stores in Taipei to sell or give out goodie bags with unspecified content during the holiday season.)

comparing field and lab results.

3 Results

Result 1. Data of real-world consumer goods (from the product line of Knock) support the hypothesis that WTP increases after showing subjects the market price for both field and lab experiments,[13] even though we elicit WTP using the BDM mechanism, teaching subjects the optimal strategy and employing paid practice rounds.

Support. Table 1 reports the *Z*- and *p*-values of the Wilcoxon Signed-Rank Test for the null hypothesis, the gap, between WTP before and after seeing the market price, equals to zero. As can be seen, the *Z*-value of all 17 items in the field experiment is 2.869 (*p*-value = 0.0041), and for the lab experiment the corresponding value is 9.058 (*p*-value = 0.0000). Therefore, we can reject the null hypothesis that the WTP before and after seeing the market price is equal both in the field and in the lab. Furthermore, if we divide the 17 items into 3 categories according to price levels, "Low" (for NT$1-NT$500), "Medium" (for NT$501-NT$1,500) and "High" (for NT$1,501 and above), we find that the gap is significantly greater than zero for the "Medium" and "High" group. In fact, the *p*-values decrease as price level goes up. This means the WTP gap between before and after seeing the market price is more significant for more expensive items.

Moreover, if we compare the means of the WTP gap in the field with those in the lab, we find the means of the "Low" and "Medium" price level groups in the field

[13] We use the repeated rounds (1 vs. 18, 2 vs. 19, 20 vs. 37 and 21 vs. 38) to check if WTP will increase or decrease when seeing goods (and price) the second time. The Z-values of Wilcoxon signed-rank test (2-tail) of WTP before and after are -1.110 (p = 0.2669) and -1.888 (p = 0.0591) in the field, -0.860 (p = 0.3899) and -0.862 (p = 0.3885) in the lab, and -1.326 (p = 0.1848) and -1.959 (p = 0.0501) combined, all smaller than that of D_{All} (Z=2.869). Therefore, our result is not due to order effect.

(-NT$16.95 and NT$21.45) are smaller than those in the lab (NT$5.24 and NT$36.47). Conversely, the mean of the "High" price level group in the field (NT$173.56) is larger than that in the lab (NT$106.92).

Result 2. The data of real-world consumer goods support the hypothesis that WTP trends toward the observed market price.

Support. In Table 2, Group 1 observations are those whose WTP before seeing the price was lower than the market price, and Group 2 observations are those whose WTP before seeing prices was higher than market price.

We have a total of 54 subjects (26 in the field and 28 in the lab), and each subject was asked their WTP for 17 different real-world consumer goods before and after seeing market prices. Therefore, we have a total of 918 observations of the WTP gap (D). Among the 918 observations, there are 33 observations in Group 2. And among these 33 observations, only 1 observation was elicited in the lab; the other 32 observations were elicited in the field. Hence, we pool together the field and lab data.

Table 2 reports the *Z*- and *p*-values of the Wilcoxon Signed-Rank Test for the null hypothesis that the gap, between WTP before and after seeing the market price, equals to zero. As can be seen, the *Z*-values for all 17 items in Group 1 is 9.425 (*p*-value = 0.0000), and for Group 2 the corresponding value is -4.533 (*p*-value = 0.0000). Therefore, we can reject the null hypothesis that the WTP before and after seeing the market price is equal, both in Group 1 and Group 2. Furthermore, the mean of the WTP gap in Group 1 is positive (NT$73.42), while in Group 2 it is negative (-NT$361.82). This suggests that the WTP moves toward the market price after seeing it. Moreover, this reaction is asymmetric: the adjustment (D) for Group 1 data is only around 6% of the

difference between Price and WTP_{bf}, but that for Group 2 data is more than 100% of the difference**.** In other words, there is overshooting when Price - $WTP_{bf} < 0$.

Result 3. In the data of real-world consumer goods, "Price – WTP_{bf}" and "Prior Experience" are the two main factors that explain the gap between WTP before and after seeing the market price.

Support. Table 3 reports the OLS and random effect GLS regressions (clustered at the subject level) predicting the difference between WTP_{after} and WTP_{before} with the difference between posted prices and WTP_{before} and whether subjects had prior information regarding the item, as well as other controls, include subject pool dummies, subject pool specific age, gender and income effects and so on:

$$(\text{WTP}_{\text{after}} - \text{WTP}_{\text{before}}) = \alpha + \sum_{i=1}^{2} \beta_i \times (\text{Price} - \text{WTP}_{\text{before}}) \times \text{Group}_i + \beta_3 \times \text{Inexperience Dummy} + (\text{Controls}) + \varepsilon$$

We set the "Inexperience Dummy" equal to 1 for the student subjects and the 6 items (item 12-17) that were not in the market when the experiment was conducted (for field subjects) and equal to 0 otherwise. In other words, we assume that student subjects have little prior knowledge of the products, while actual consumers in the field do have some prior information regarding existing products.[14] As can be seen in the table, "Price – WTP_{bf}" for Group 2 has coefficients of 1.6-1.8 and are significant at the 0.1% level in both OLS and random effect GLS regressions. The coefficients for "Price – WTP_{bf}" for Group 1 are roughly 0.2-0.3, but are still statistically significant at the 0.1% level in the random effect GLS regressions. The coefficients for "Inexperience" (which

[14] Table S3 reports alternative specifications for prior experience. In particular, we include a "New Product Dummy" for items not in the market and an interaction term of New Product and Subject Pool Dummy for the field. Both are significant, and the coefficient of "Price – WTP_{bf}" for Group 2 remains robust to this specification (at around 1.8-1.9), while that for Group 1 becomes insignificant.

captures the information effect of price) are large (90-150) and statistically significant at the 0.1% level in all but the simple OLS regression without additional controls (where it is still marginally significant at the 10% level). Among the controls, two are of special interest: earnings in the paid practice round (to test if there is any wind-fall effect) and dummies for one's favorite item (for Group 1 and Group 2 separately to test if strong taste would make WTP persistent). Nonetheless, coefficients for these variables are neither statistically significant, nor economically significant. In the random effect GLS specification, "Paid Practice Payoffs" have a statistically insignificant 2.83% effect on the WTP gap, while "Favorite" dummies lower the WTP gap by only NT$13 (less than 40 cents in USD; also statistically insignificant), merely one tenth of the effect of "Inexperience".

4 Discussion

We used an experimental design similar to that used by Plott and Zeiler (2005) in the paid-practice rounds.

We designed the paid-practice rounds with three important purposes in mind: First, practice rounds with real consequences help to make sure subjects fully understand the BDM mechanism. Indeed, PZ used a similar procedure to make sure subjects learned BDM so well that they did not observe the WTA-WTP gap (for mugs). Second, these "expensive" paid practice rounds provide some money for subjects to spend in the real-world consumer goods rounds in the next phase, and help us avoid potential bankruptcy problems. In fact, none of our subjects reneged on their purchased.[15]

[15] One might wonder if these earnings were viewed as wind-falls and treated differently. However, as shown in the previous section, paid practice round earnings had little effect on subsequent WTP gaps.

Thirdly, adopting PZ's design provides the (usually under-appreciated) opportunity to replicate their findings. This is especially useful since Isoni, Loomes and Sugden (2010) replicated and reassessed the (unreported) results of Plott and Zeiler (2005) in the lottery rounds, namely there was a gap between WTA and WTP in the lottery rounds, though no gap was observed in the mug round.

Our results are consistent with those of Isoni, Loomes and Sugden (2010), but less strong. Table 4 shows the summary and test statistics of our paid-practice rounds (lottery and NTU souvenir rounds) pooling data from the field and lab.[16] As can be seen in the table, all of the lottery rounds are significant at least at 1% significance level. That is, we can reject the null hypothesis that WTA equals WTP in the lottery rounds. Furthermore, in the mug, folder, travel mug and notebook rounds, the *p*-values are too large to reject the null hypothesis. That is, we also obtain the "no gap" results in the NTU souvenir rounds.[17]

Note that one caveat exists in the comparison of signed-rank and rank-sum test results (which is also present in the analysis performed by Isoni, Loomes and Sugden, 2010): The signed-rank test uses paired data of the whole sample, giving it greater power than the unpaired rank-sum test (which utilizes a split sample). Hence, one cannot compare significance results from the lottery and NTU souvenir rounds directly if one test is conducted on the lottery rounds while another is performed on the NTU souvenir rounds.

[16] This table replicates Table 2 of Isoni, Loomes and Sugden (2010) using our data. The only difference is that they report 1-tail signed-rank and rank-sum test results with asterisks indicating levels of significance, while we report exact p-values for 2-tail tests.

[17] We have no Wilcoxon rank-sum test results in the pencil case and mouse pad set rounds, since we asked all subjects their WTP in these two rounds. This is to familiarize subjects to the rule of the next phase (only asking WTP).

To address this potential issue, we split the sample and conduct the same rank-sum test for both the lottery rounds and NTU souvenir rounds. Results are reported in Table 5. Compared with the results reported in Table 4, the rank-sum test results are less significant for the lottery rounds, making them "closer" to the results of the mug rounds. Given Isoni, Loomes and Sugden (2010) did not perform any formal test to see if the difference in Z-values are significant, one might need to be more cautious before accepting their conclusion, namely the PZ procedure reduces the WTA-WTP gap only for mugs, but not lotteries.

Furthermore, our results are also consistent with those of Plott and Zeiler (2010), though more so in the field than in the lab. In particular, Table 6 shows the amount of "boundary valuations" we observe in the WTA and WTP for high stake lotteries. Both in the field and lab, we find a lot of WTA above or equal to the upper bound of the value support, while none below or equal to the lower bound. We also find more WTP below or equal to the lower bound of the value support, compared to above or equal to the upper bound. However, such behavior is more prominent in the field than in the lab. Table 7 shows this explains a large portion of the WTA-WTP gap, as most of the adjusted WTA/WTP ratios are not significantly greater than one after excluding the boundary valuations. This replication contributes to the on-going research regarding the WTA-WTP gap of lotteries, though further investigation is required to understand the underlying force driving such results.

5 Conclusion

We investigate whether and how the number shown on the price tags affects

willingness-to-pay by using the BDM mechanism, teaching subjects the optimal strategy and employing paid practice rounds on real-world consumer goods (from the product line of Knock) to elicit the true valuations. We implement similar procedures in both field and lab.

We conclude that the price tag does have a significant effect on WTP in both field and lab. Furthermore, this effect is more significant with high-end products that have high price levels. In particular, for those whose WTP before seeing the price tag is lower than the market price, their WTP will increase NT$73.42 (roughly US$2.22) on average after seeing the price tag. And for those whose WTP before seeing the price tag is higher than the market price, their WTP will decrease NT$361.82 (roughly US$10.96) on average. Therefore, WTP trends toward the observed market price.

Additionally, the data in our paid practice rounds, adopted from a design similar to that of Plott and Zeiler (2005), could be viewed as a replication of Plott and Zeiler (2005) and Isoni, Loomes and Sugden (2010) which provides further support to their results. That is, the data from our lottery rounds do not support the hypothesis that WTA equals WTP, while the data from the NTU souvenir (mug, folder, travel mug, notebook, pencil case, and mouse pad set) rounds do support the hypothesis that WTA equals WTP. However, our weaker results casts doubts on Isoni, Loomes and Sugden (2010)'s conclusion that the PZ procedure generates completely different behavior for mugs and lotteries.

In conclusion, after controlling for possible procedural artifacts, we still observe a significant effect of price tag on WTP, while the direction of this effect depends on the difference between the consumer's initial WTP and the market price. Moreover, the

negative effect when peoples' initial WTP is higher than market price is more economically significant than the positive effect. This result suggests that when firms determine prices or discounts, they might have to place greater consideration on the negative "outside-opportunity" effect instead of the positive "price placebo" effect.

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Table 1- Wilcoxon Signed-Rank Test (H_0: $WTP_{af} - WTP_{bf} = 0$)

	Field Experiment				Lab Experiment			
	Obs.	**Mean (NT$)**	**Z**	**p-value**	**Obs.**	**Mean (NT$)**	**Z**	**p-value**
$\mathbf{D_{All}}$	442	63.84	2.869	0.0041**	476	52.15	9.058	0.0000***
$\mathbf{D_{Low}}$	130	-16.95	-1.720	0.0854	140	5.24	1.941	0.0523
$\mathbf{D_{Med}}$	156	21.45	2.107	0.0351*	168	36.47	5.108	0.0000***
$\mathbf{D_{High}}$	156	173.56	3.410	0.0007***	168	106.92	7.366	0.0000***

Note:
1. D = WTP after seeing market price – WTP before seeing market price = $WTP_{af} - WTP_{bf}$.
2. All - all price level,
   Low - low price level (price range: NT$500 and below, roughly US$16.67 and below),
   Med - medium price level (price range: NT$501-NT$1,500, roughly US$16.67-US$50),
   High - high price level (price range: NT$1,501 and above, roughly US$50 and above).
3. Significance level (2-tail): * = 5%, ** = 1%, *** = 0.1%.

Table 2- Wilcoxon Signed-Rank Test (H_0: $WTP_{af} - WTP_{bf} = 0$)

	The WTP before Seeing Price is Lower than Market Price (Group 1)					The WTP before Seeing Price is Higher than Market Price (Group 2)				
	Obs.	**Mean (NT$)**	**Price - WTP**	**Z**	**p-value**	**Obs.**	**Mean (NT$)**	**Price - WTP**	**Z**	**p-value**
$\mathbf{D_{All}}$	885	73.42	1205.62	9.425	0.0000***	33	-361.82	-231.18	-4.533	0.0000***
$\mathbf{D_{Low}}$	256	1.60	269.45	1.066	0.2865	14	-134.29	-94.29	-3.271	0.0011**
$\mathbf{D_{Med}}$	312	43.54	715.09	5.847	0.0000***	12	-342.5	-197.42	-2.357	0.0184*
$\mathbf{D_{High}}$	317	160.85	2444.45	7.852	0.0000***	7	-850	-562.86	-2.290	0.0220*

Note:
1. D = WTP after seeing market price – WTP before seeing market price = $WTP_{af} - WTP_{bf}$.
2. All - all price level,
   Low - low price level (price range: NT$500 and below, roughly US$16.67 and below),
   Med - medium price level (price range: NT$501-NT$1,500, roughly US$16.67-US$50),
   High - high price level (price range: NT$1,501 and above, roughly US$50 and above).
3. Significance level (2-tail): * = 5%, ** = 1%, *** = 0.1%.

Table 3- OLS and Random Effect GLS Regressions

$Y = WTP_{af} - WTP_{bf}$	**OLS 1**	**OLS 2**	**GLS 1**	**GLS 2**
Price – WTP_{bf} (Group 1)	0.0244**	0.0157	0.0337***	0.0299***
	(0.00914)	(0.00930)	(0.00842)	(0.00857)
Price – WTP_{bf} (Group 2)	1.573***	1.607***	1.797***	1.819***
	(0.133)	(0.150)	(0.124)	(0.143)
Inexperience Dummy	40.11	152.5***	88.02***	131.4***
	(21.85)	(30.17)	(24.61)	(27.39)
Age (Lab)		-17.42		-18.37
		(13.00)		(23.21)
Age (Field)		5.188***		5.433*
		(1.418)		(2.525)
Gender (Lab)[2]		0.770		1.757
		(25.52)		(45.58)
Gender (Field)		55.71*		54.22
		(25.57)		(45.63)
Disp. Income (Lab)[3]		4.77		4.69
		(4.66)		(8.32)
Disp. Income (Field)		3.96*		3.71
		(1.73)		(3.08)
Favorite (Group 1)[4]		-6.365		-12.87
		(39.17)		(35.44)
Favorite (Group 2)		-78.74		-7.394
		(136.2)		(125.7)
Paid Practice Payoffs		0.0271		0.0283
		(0.0168)		(0.0299)
Subject Pool[5]		-461.2		-493.2
		(276.6)		(492.5)
Constant	14.90	186.7	-27.02	207.2
	(16.52)	(268.1)	(21.97)	(477.0)
Observations	918	918	918	918
R-squared	0.159	0.215		
Number of subject			54	54

Note:
1. Significance level: * = 5%, ** = 1%, *** = 0.1%.
2. Gender Dummy: Female = 1; Male = 0.
3. Disposable Income: Per unit with NT$1,000 of monthly disposable income.
4. Favorite Dummy: The item that is the subject's favorite = 1; Otherwise = 0.
5. Subject Pool Dummy: Field = 1; Lab = 0.

Table 4- Summary and Test Statistics of Paid-practice Rounds (paired signed-rank test for lottery rounds)

WTA valuation							WTP valuation							WTA /WTP[a]		p-value[b]
Lott. No.	**obs**	**EV**	**Mean**	**Med -ian**	**Std. Dev.**	**Mean / EV**	**Lott. No.**	**obs**	**EV**	**Mean**	**Med -ian**	**Std. Dev.**	**Mean / EV**	**Mean**	**Med -ian**	
1	54	10	24.9	10	80.81	2.49	**4**	54	15	12.8	13.5	6.87	0.86	2.68	1.28	0.0035**
2	54	18	18.4	18	9.18	1.02	**5**	54	23	19.2	20	9.85	0.84	1.70	1.15	0.0030**
3	54	4	18.7	20	11.95	4.68	**6**	54	9	18.9	20	14.11	2.10	2.62	1.50	0.0046**
7	54	245	259.1	250	157.35	1.06	**11**	54	295	271.2	250	277.15	0.92	11.37	1.23	0.0030**
8	54	100	180.0	155	149.91	1.80	**12**	54	150	142.0	100	113.41	0.95	3.50	1.50	0.0000***
9	54	100	181.0	100	150.84	1.81	**13**	54	150	148.8	134	113.71	0.99	5.73	1.67	0.0001***
10	54	150	249.3	184	195.49	1.66	**14**	54	200	192.9	150	139.37	0.96	3.12	1.50	0.0013**
Mug	30		190.6	150	123.35		**Mug**	24		131.9	120	95.56		1.45	1.25	0.0723
File	30		75.7	40	126.40		**File**	24		46.7	30	51.83		1.62	1.33	0.1597
T. Mug	24		146.7	105	97.98		**T. Mug**	30		138.4	150	78.96		1.06	0.70	0.9095
Notebk	24		123.9	100	115.93		**Notebk**	30		90.1	80	58.62		1.38	1.25	0.6246
Case	0						**Case**	54		68.7	59	57.33				n/a
Pad	0						**Pad**	54		63.2	50	52.26				n/a

a – Ratio is computed as (WTA + c)/WTP for lotteries, while for the NTU product it is the ratio of means and medians, respectively. The constant c is the difference between expected values of the two lotteries, and is $5 for small-stakes lotteries (1-6) and $50 for high-stakes lotteries (7-14). We set WTP equal to 1 in cases where WTP was equal to 0.

b – Test based on Wilcoxon signed-rank test for lotteries and two-sample Wilcoxon rank-sum (Mann-Whitney) test for NTU goods.
Significance level (2-tail): * = 5%, ** = 1%, *** = 0.1%.

Table 5- Summary and Test Statistics of Paid-practice Rounds (split sample test for lottery rounds)

WTA valuation							WTP valuation							WTA /WTP[a]		p-value[b]
Lott. No.	obs	EV	Mean	Med -ian	Std. Dev.	Mean / EV	Lott. No.	obs	EV	Mean	Med -ian	Std. Dev.	Mean / EV	Mean	Med -ian	
1	30	10	36.6	10	107.4	3.66	**4**	24	15	11.9	12.5	6.1	0.79	3.50	1.20	0.0484*
2	30	18	18.8	18	9.5	1.04	**5**	24	23	19.8	19	12.0	0.86	1.20	1.21	0.0394*
3	30	4	19.5	20	10.9	4.87	**6**	24	9	17.8	11	17.5	1.97	1.38	2.27	0.0124*
7	30	245	247.4	247.5	169.7	1.01	**11**	24	295	237.3	200	170.5	0.80	1.25	1.49	0.0891
8	30	100	176.5	177.5	112.8	1.77	**12**	24	150	129.5	100	136.5	0.86	1.75	2.28	0.0001***
9	30	100	191.8	125	133.1	1.92	**13**	24	150	139.2	134.5	107.2	0.93	1.74	1.30	0.0026**
10	30	150	287.0	200	210.6	1.91	**14**	24	200	212.4	199.5	156.2	1.06	1.59	1.25	0.0140*
Mug	30		190.6	150	123.4		**Mug**	24		131.9	120	95.6		1.45	1.25	0.0723
File	30		75.7	40	126.4		**File**	24		46.7	30	51.8		1.62	1.33	0.1597
1	24	10	10.4	10	9.8	1.04	**4**	30	15	13.6	15	7.4	0.91	1.13	1.00	0.5201
2	24	18	18.0	18	9.0	1.00	**5**	30	23	18.8	20	7.9	0.82	1.22	1.15	0.0922
3	24	4	17.8	16.5	13.3	4.45	**6**	30	9	19.8	20	11.0	2.20	1.15	1.08	0.4455
7	24	245	273.8	250	142.6	1.12	**11**	30	295	298.3	250	340.1	1.01	1.09	1.20	0.0476*
8	24	100	184.3	150	189.0	1.84	**12**	30	150	152.0	110	92.2	1.01	1.54	1.82	0.0145*
9	24	100	167.5	100.5	172.5	1.68	**13**	30	150	156.5	135	119.9	1.04	1.39	1.11	0.1256
10	24	150	202.1	165.5	167.3	1.35	**14**	30	200	177.3	150	124.8	0.89	1.42	1.44	0.0235*
T. Mug	24		146.7	105	98.0		**T. Mug**	30		138.4	150	79.0		1.06	0.70	0.9095
Notebk	24		123.9	100	115.9		**Notebk**	30		90.1	80	58.6		1.38	1.25	0.6246

a – Ratio is computed as the ratio of WTA means and medians plus c over WTP means and medians for lotteries, while for the NTU product it is the ratio of means and medians, respectively. The constant c is the difference between expected values of the two lotteries, and is $5 for small-stakes lotteries (1-6) and $50 for high-stakes lotteries (7-14). We set WTP equal to 1 in cases where WTP was equal to 0.

b - Test based on two-sample Wilcoxon rank-sum (Mann-Whitney) test for both lotteries and NTU goods.
Significance level (2-tail): * = 5%, ** = 1%, *** = 0.1%.

Table 6- Boundary Valuations for Three Uncertain Large Stake Lotteries

	WTA Boundary Valuations (Lotteries 7, 8, 10)		WTP Boundary Valuations (Lotteries 11, 12, 14)	
	Field	Lab	Field	Lab
Valuations at or above the upper bound of the value support	34.62% (27)	14.29% (12)	10.26% (8)	5.95% (5)
Valuations at or below the lower bound of the value support	0% (0)	0% (0)	20.51% (16)	8.33% (7)

Note: Field N=78 (26 subjects); lab N=84 (28 subjects).

Table 7- Mean (Median[b]) Adjusted WTA/WTP Ratios for Lotteries

	L3/L6	L7/L11	L8/L12	L9/L13	L10/L14
All (Field)	1.882 (1.75***) N=25[a]	22.13 (1.417**) N=26	2.597 (1.75***) N=25[a]	3.340 (1.88***) N=25[a]	4.744 (2.325***) N=26
Upper Boundary Gap	2.013 (2*) N=3	52.82 (2.2***) N=9	4.352 (4.5**) N=7	6.589 (1.88**) N=5	6.210 (2.75**) N=7
Lower Boundary Gap	N=0	134.2 (40.83*) N=4	4.624 (5**) N=5	N=0	16.4 (15**) N=5
Both valuations inside the Bounds	1.865 (1.75**) N=22	0.967 (1.167) N=11	1.288 (1.333) N=13	2.528 (2.025**) N=20	1.791 (1.25) N=15
All (Lab)	1.584 (1.208) N=28	1.371 (1.045) N=28	2.285 (1.347***) N=28	2.152 (1.25*) N=26[a]	1.620 (1.193) N=28
Upper Boundary Gap	1.143 (1.143) N=1	1.902 (1.64**) N=5	6.06 (3**) N=5	N=0	N=0
Lower Boundary Gap	N=0	5 (5) N=1	7.367 (3.235*) N=4	N=0	4.6 (4.6) N=2
Both valuations inside the Bounds	1.600 (1.25) N=27	1.086 (1) N=21	1.254 (1.083) N=19	2.152 (1.25) N=26	1.391 (1.031) N=26

Note: [a]Mean and median of adjusted WTA+c/WTP ratio. Ratios for two subjects are undefined because lottery valued at NT$0 as buyer in lottery 13 (lab). In lottery 6, 12, 13 (field), one buyer valued the lottery at $0. The sign test includes the $0 bids.
[b]Two-tailed signed-rank test results: *=0.1 **=0.5 ***=0.01.

Appendix [For Online Viewing Only]

A.1 List of Lottery and NTU Souvenir Used

Lottery Ticket

	Val. Type	Lott. No.	Our Lottery	Plott & Zeiler (2005) Lottery A	Plott & Zeiler (2005) Lottery B
Small-stake lotteries	WTA	1	(NT$10, 0.5; NT$10, 0.5)	($0.20, 0.5; $0.20, 0.5)	($0.20, 0.5; $0.20, 0.5)
		2	(NT$18, 0.5; NT$18, 0.5)	($0.35, 0.5; $0.35, 0.5)	($0.35, 0.5; $0.35, 0.5)
		3	(NT$35, 0.3; NT$-10, 0.7)	($0.70, 0.3; $-0.20, 0.7)	($-0.20, 0.3; $0.70, 0.7)
	WTP	4	(NT$15, 0.5; NT$15, 0.5)	($0.30, 0.5; $0.30, 0.5)	($0.30, 0.5; $0.30, 0.5)
		5	(NT$23, 0.5; NT$23, 0.5)	($0.45, 0.5; $0.45, 0.5)	($0.45, 0.5; $0.45, 0.5)
		6	(NT$40, 0.3; NT$-5, 0.7)	($0.80, 0.3; $-0.10, 0.7)	($-0.10, 0.3; $0.80, 0.7)
Large-stake lotteries	WTA	7	(NT$350, 0.7; NT$0, 0.3)	($7, 0.7; $0, 0.3)	($0, 0.7; $7, 0.3)
		8	(NT$250, 0.4; NT$0, 0.6)	($5, 0.4; $0, 0.6)	($0, 0.4; $5, 0.6)
		9	(NT$400, 0.5; NT$-200, 0.5)	($8, 0.5; $-4, 0.5)	($-4, 0.5; $8, 0.5)
		10	(NT$500, 0.3; NT$0, 0.7)	($10, 0.3; $0, 0.7)	($0, 0.3; $10, 0.7)
	WTP	11	(NT$400, 0.7; NT$50, 0.3)	($8, 0.7; $1, 0.3)	($1, 0.7; $8, 0.3)
		12	(NT$300, 0.4; NT$50, 0.6)	($6, 0.4; $1, 0.6)	($1, 0.4; $6, 0.6)
		13	(NT$450, 0.5; NT$-150, 0.5)	($9, 0.5; $-3, 0.5)	($-3, 0.5; $9, 0.5)
		14	(NT$550, 0.3; NT$50, 0.7)	($11, 0.3; $1, 0.7)	($1, 0.3; $11, 0.7)

NTU Souvenirs

Item#	Product Name	Figure	Color	Price (NT$)
1	NTU Druken Fall Moon Mug (台大醉月秋色馬克杯)		Black (黑) White (白)	380
2	NTU Library File Folder (台大圖書館卷宗夾)		White (白) Dark Red (暗紅)	50
3	NTU Travel Mug (台大隨行杯)		Black (黑) Brown (咖啡) Pink (紅)	220
4	NTU Diamond-Shape Notebook (台大菱格筆記本)		White (白) Gold (金)	90
5	NTU Pencil Case (台大經典筆袋)		Black (黑)	120
6	NTU Mousepad + Pen (台大松鼠記事滑鼠墊+筆)		White (白)	200

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A.2 List of Knock Products Used

Item#	Product Name	Figure	Color	Price (NT$)
1	Sports Coin-Mate (Animal) (歡樂鑰匙零錢包)		Blue (大象-湖藍) Pink (熊貓-粉紅) Yellow (狗-粉黃)	170
2	Sports Coin-Mate (Basketball) (籃球鑰匙零錢包)		Black (黑) Red (紅) Orange (橘)	210
3	Sports Phone Pouch (Basketball) (籃球手機衣套 (L))		Black (黑) Purple (紫) Yellow (黃)	460
4	Digital Camera Case (Animal) (歡樂隨身數位相機包)		Blue (熊貓-湖藍) Red (大象-紅) Pink (熊貓-粉紅)	480
5	Sports Phone Pouch (Warm-Up Jacket) (納克衣型手機套)		Blue (B5-藍) Pink (A3-粉紅衣/紅袖) Grey (C-6灰衣/黃袋)	480
6	Digital Camera Pouch (數位相機專業記憶包)		Orange/Black (橘/黑) Sky Blue/Grey (天空藍/灰) Red/Grey (紅/灰)	680
7	Mobile-Wear Phone Pouch (Wrap-Around) (全民慢跑專用臂包 (L))		Black (黑) Blue (藍) Red (紅)	730
8	Trackers Wrap-Around (越野多功能臂包)		Dark Blue/Light Blue (深藍/淺藍) Light Blue/Grey (淺藍/灰) Red/Grey (紅/灰)	880
9	Camera Case (相機防護套)		Black (黑) Blue (藍) Red (紅)	980
10	Laptop Sleeve (筆電防護套)		Black/Grey (黑/灰) Dark Blue/Pink (深藍/粉紅) Blue/Apple Green (湖藍/青蘋綠)	1080
11	Active Shoulder Bag (活力隨行包)		Blue/Black (藍/黑) Purple/Black (紫/黑) Magenta/Grey (洋紅/灰)	1280
12	Laptop EZ Carrier (筆電隨身包)		Royal Blue (寶藍) Apple Green (青蘋綠) Red (紅)	1880
13	Messenger Bag (掀蓋側背包)		Black (黑) Purple/Black (紫/黑) Magenta/Grey (洋紅/灰)	2280
14	Ladies Carry-All (都會肩背包)		Black (黑) Ruby (桃紅) Sky Blue (天空藍)	2880
15	Tote Bag (休閒托特包)		Black/Grey (黑/灰) Purple/Grey (紫/灰) Yellow/Grey (黃/灰)	3280
16	Laptop Handbag (筆電手提側背包)		Black (黑) Purple/Black (紫/黑) Magenta/Grey (洋紅/灰)	3680
17	Executive Laptop Sleeve (筆電公事包)		Black/Olive Green (黑/橄欖綠) Black/Stripes (黑/壓紋) Grey/Sky Blue (灰/天空藍)	4280

A.3 Sample Instructions and Post Experimental Survey (for the Field)

國立台灣大學台灣社會科學實驗室(TASSEL)實驗說明

這是一個關於個人購買行為的實驗。本實驗一共分成兩個部份。第一部分共有 20 回合，第二部分共有 38 回合。實驗結束後，您會得到車馬費新台幣 500 元，以及第一部分與第二部份所獲得的報酬或商品。最低報酬是車馬費 500 元，但是有可能在實驗中得到更多。

第一部份

共 20 回合。每回合都有一個(模擬)福袋(內含代幣若干)或真實商品，可能在您手上，也可能在實驗者手上。如果東西在您手上，您可以選擇用它來交換代幣；如果東西在實驗者手上，您可以用代幣來換取。請注意電腦螢幕畫面左下方，顯示東西屬於哪一方。

如果**東西在您手上**，實驗者想用代幣跟您交換它。您要決定願意接受多少代幣交換。接著，電腦會隨機抽出一個數字(與您的決定無關)。如果您的決定比電腦抽出的數字**小**(或一樣)，雙方就交換成功，您得到代幣，而實驗者則得到原本在您手中的東西。**請注意，您得到的代幣是電腦抽出來的數字，而不是您的決定**。

如果**東西在實驗者手上**，您可以決定願意拿多少代幣去跟實驗者換取它。接著，電腦會隨機抽出一個數字(與您的決定無關)。如果您的決定比電腦抽出的數字**大**(或一樣)，您就會得到實驗者手中的東西，而實驗者得到代幣。**請注意，您付出的代幣是電腦抽出來的數字，而不是您的決定**。這種交換方式，是希望您的決定能夠反映**東西在您心目中的價值**。

例 1：假設**東西在您手上**。如果您的決定是 10，而電腦抽出的數字是 12，比您的決定高，則實驗者得到東西，但您可以獲得 12 個代幣。但是如果電腦抽出的數字是 9，比您的決定(10)低，則交換不會成功。

例 2：假設**東西在實驗者手上**。如果您的決定是 10，而電腦抽出的數字是 9，比您的決定低，則您會得到東西，但需付出 9 個代幣。如果電腦抽出的數字是 12，比您的決定高，則交換不會成功。

每回合結束時，若您持有福袋，電腦會幫你打開它，且袋中的代幣數量會按照電腦螢幕的機率出現。所以，除了在交換過程中得到(或付出)代幣之外，您還可以獲得福袋中的代幣。每回合的代幣都會累積起來。20 回合結束後，螢幕上會顯示累計的代幣，以及得到哪些真實商品。如果您對於這個結果不滿意，可以選擇不繼續實驗，只領取車馬費 500 元(但您也必須放棄實驗中得到的商品)。如

果您滿意這個結果，這就變成您第一部份的報酬，也可以得到所有在實驗中獲得的商品。在實驗最後，這些代幣會以 1:1(一個代幣等於一元)轉換成新台幣。

第二部份

共有 38 回合，全部是真實的商品。此部分的交換方式和第一部份一樣，但是東西都在實驗者手上；而且 38 回合結束後，只有一個回合會真的發生。

實驗規則：

每回合實驗者手上都有一種商品，每種商品各有三種顏色，照片顯示在電腦螢幕上。

38 回合實驗結束後，電腦會在 38 回合中隨機抽出其中一個回合，讓它真的發生。如果被抽中的回合，您的決定比電腦抽出的數字大(或一樣)，您就會得到該商品，**可以從三種顏色中，任選一種帶回家**；若您的決定比電腦抽出的數字低，您就不能得到該商品。電腦是隨機抽出回合與數字，跟您的決定無關。

若您得到商品，必須付出的代幣為電腦抽中的數字。如果第一部份的累積代幣不足以支付，須補足差額。因此，請小心決定您的數字。

您的決定應該要反映**東西在您心目中的價值**。舉例來說，假設此商品對您的價值是 10。如果您的決定是 10，而電腦抽出的數字是 9，則您可以得到該商品，但是必須付出 9 個代幣。可是如果您的決定是 0，那即使電腦抽出的數字等於 1，遠低於您真正的價值(10)，您仍然無法得到該商品。

您在實驗中可能會看到「市價」，指的是台北市 MOMO 百貨 KNOCK 專櫃於 2010 年 1 月 13 日的實際銷售價格。部分商品尚未上市，則為預計的上市價格。

第二部分實驗結束後，所有代幣會以 1:1(一個代幣等於一元)轉換成新台幣。除此以外，您還會獲得實驗中得到的商品。

Post Experimental Survey

基本資料：

姓名：_____　　性別：_____

系級：_____　　年齡：_____

學號：_____

以下請就 KNOCK 潛水布商品部份回答：

一、請問你如何決定你的出價？

二、如果你有買到商品，請問你打算如何使用它？（例如：自己用/ 送家人 / 送朋友…等）

三、給定已知電腦的抽出價格，你會改變你的出價嗎？

以下為電子版問卷：

A. 學號：_____

B. 手機號碼：_____

C. 年級：(1)大一、(2)大二、(3)大三、(4)大四、(5)大五以上或研究所

D. 年齡：_____

E. 性別：(1)男性、(2)女性

F. 請選出你最想要的五種商品：（1 為最想，以此類推，寫出商品編號即可）
→17 種商品的圖示加品名
1.____ 2.____ 3.____ 4.____ 5.____

G. 對於使用潛水布材質（Neoprene）製成的商品，你的使用經驗如何？
(1)非常滿意、(2)滿意、(3)普通、(4)不滿意、(5)非常不滿意

H. 請問你有男朋友或女朋友嗎？ (1)有、(2)沒有

I. 請問你一個月的收入大概是多少？（含打工家教收入與零用錢）
(1)5,000 元以下、(2) 5,001-10,000 元、(3) 10,001-15,000 元、(4) 15,001-20,000 元、(5) 20,001 元以上

J. 請問你一個月會用來消費的錢大概是多少？（收入扣掉固定支出與儲蓄）
(1)5,000 元以下、(2) 5,001-10,000 元、(3) 10,001-15,000 元、(4) 15,001-20,000 元、(5) 20,001 元以上

K. 請問你帶了多少錢來參加本實驗？_____

L. 請問你是否有在網拍當「賣家」的經驗？ (1)有、(2)沒有

M. 請問你喜歡運動嗎？ (1)有、(2)沒有
平常從事的運動是？ (1)慢跑 (2)騎腳踏車 (3)登山 (4)打籃球 (5)打棒球 (6)其他

N. 請問你有筆記型電腦嗎？ (1)有、(2)沒有
如果有，請問是幾吋？(1)7 吋以下、(2)8-9 吋、(3) 10-11 吋、(4) 12 吋、(5) 13 吋、(6)14 吋、(7)15 吋以上

[English Translation] Experimental Instructions for TASSEL, NTU

This is an experiment on individual buying behavior. This experiment is divided into two parts, with 20 rounds in the first and 38 rounds in the second. After the experiment, you will earn a show-up fee of 500NT dollars, and the retail products or money you earn during the two parts of the experiment. The lowest amount you may earn is the show-up fee but you may earn more in the experiment.

Part 1

There are 20 rounds in Part 1. In each round, there will be either a (hypothetical) goodie bag (with some experimental currency units (hereafter, ECU) inside), or an actual retail product. The item will either be in your possession, or in the hands of the experimenter. If you have the item, you can trade it for some ECUs. On the other hand, if the experimenter has the item, you can trade some ECUs for the item. Please pay attention to the bottom-left of the screen, which shows who possesses the product.

When **you have the item**, the experimenter will have a chance to use some ECUs to exchange for the item. Hence, you will have to decide how many ECUs you are willing to accept for this trade. Then, the computer will randomly draw a number (which has nothing to do with your decision). If your decision is **less** than (or equal to) the number drawn by the computer, you make a deal. You will earn ECUs and the experimenter will obtain the product. **Attention: The amount of ECUs you earn equals to the number drawn by the computer, not your decision.**

When **the experimenter has the item**, you will have to decide how many ECUs you are willing to pay in exchange of the item. Then, the computer will randomly draw a number (which has nothing to do with your decision). If your decision is **more** than (or equal to) the number drawn by the computer, you make a deal and obtain the item, while the experimenter earns ECUs. **Attention: The amount of ECUs you pay equals to the number drawn by the computer, not your decision.**

This procedure of exchange is designed in hope that your decision will reflect **your true value of the item**.

Example 1: Suppose **you have the item**, your decision is 10 (ECUs), and the number drawn by computer is 12, higher than your decision. Then, the experimenter obtains the item and you earn 12 ECUs. If the number drawn by computer is 9, which is lower than your decision (10), the deal fails.

Example 2: Suppose **the experimenter has the item**, your decision is 10 (ECUs), and the number drawn by computer is 9, lower than your decision. Then, you obtain the item and pay the experimenter 9 ECUs. If the number drawn by computer is 12, which is higher than your decision (10), the deal fails.

After each round, if you possess a goodie bag, the computer will open it for you and the amount of ECUs inside will be determined by the probability shown on the

screen. Thus, in addition to the ECUs you earn/pay during the round, you will also earn the ECUs contained in the goodie bag. All ECUs will be accumulated, and after 20 rounds, the computer screen will show the total amount of ECUs you earned and all the retail products you obtained. If you are not satisfied with the result, you can quit the experiment and earn only the show-up fee NT 500 (though you will also have to forego the items you obtained). If you are satisfied with the result, the ECUs will be your earnings in Part 1, and you can take home the retail products you obtained. At the end of the experiment, the ECUs will be converted into NT dollars at the exchange rate of 1:1 (1 ECU = 1 NT dollar).

Part 2

There are 38 rounds in Part 2, all with actual retail products. The procedure of trade is the same as in Part 1, except initially the experimenter has all the products and only one round will be realized at the end of the 38 rounds.

Instructions

In each round, there will be one retail product possessed by the experimenter. Each product has three different colors, and photos will be shown on the screen.

At the end of the 38 rounds, the computer will randomly choose a round to realize. If your decision in that round is higher than (or equal to) the number drawn by the computer, you will obtain the product. **Choose one out of the three different colors and take it home.** If your decision is lower than the number drawn by the computer, you will not be able to get the product. The computer draws the round and number randomly, and they have nothing to do with your decision.

If you obtain the product, you have to pay the amount (in ECUs) equal to the number drawn by the computer. If the ECUs you earned in Part 1 is insufficient, you will have to pay the difference out of your own pocket. So, please make your decisions carefully.

Your decision should reflect **your true value of the product**. For example, suppose you value the product at 10. If your decision is 10 and the number drawn by computer is 9, you can obtain the product (but have to pay 9ECU). But if your decision is 0, you will not be able to obtain the product even if the number drawn by computer is 1, which is much lower than your true value (10).

The “market price” you might see in the experiment is the actual retail price at the KNOCK counter at Taipei’s MOMO department store on January, 13th, 2010. Some of the products are not on the market yet, so prices for those products reflect only estimated market prices.

At the end of the Part 2, all ECUs will be converted into NT dollars at an exchange rate of 1:1 (1 ECU = 1 NT dollar). Besides, you will also obtain the retail products you obtained throughout the experiment.

Post Experimental Survey

Basic Information

Name:_____ Gender:_____

Department/ Year:_____ Age:_____

Student ID #:_____

Please answer the following question based on KNOCK Neoprene products

1. How did you decide your bid?
2. What would you do with the item if you happen to obtain it? (Self-used, gift for family, gift for friends…)
3. Will you change your bid if you knew the number chosen by computer?

Electronic Survey

A. Student ID #:_____
B. Cell phone #:_____
C. Which Year You Are: (1) Freshman (2) Sophomore (3) Junior (4) Senior (5) Returning senior or graduate
D. Age:_____
E. Gender: (1) Male (2) Female
F. List five products you want most. (1 stands for the one you want most, and so on. Writing down the number of the product is sufficient.)
G. →List of all 17 products (Name and Figure)

   1.____ 2.____ 3.____ 4.____ 5.____
H. What is your past experience using Neoprene products?

   (1) Very satisfied, (2) Satisfied, (3) Okay, (4) Unsatisfied, (5) Very unsatisfied.
I. Do you have a significant other? (1) Yes, (2) No
J. How much do you usually earn each month? (including part time jobs and allowance)

   (1) Below or equal to NT$5,000, (2) NT$5,001~10,000, (3) NT$10,001~15,000, (4) NT$15,001~20,000, (5) Above NT$20,000.
K. How much do you usually spend each month? (excluding fixed payments and and savings)

   (1) NT$5,000 or below, (2) NT$5,001~10,000, (3) NT$10,001~15,000, (4)

NT$15,001~20,000, (5) Above NT$20,000.

L. How much money did you bring to this experiment?

M. Have you ever been a seller online? (1) Yes (2) No

N. Do you like sports? (1) Yes (2) No

If yes, what sport? (1) Jogging, (2) Cycling, (3) Mountain climbing, (4) Basketball, (5) Baseball, (6) Other, please specify_____

O. Do you own a laptop? (1) Yes (2) No

If yes, what size? (1) 7 inch or below, (2) 8~9 inch, (3) 10~11 inch, (4) 12 inch, (5)13 inch, (6) 14 inch (7) 15 inch or above.

A.4 Screenshots of the Experimental Program

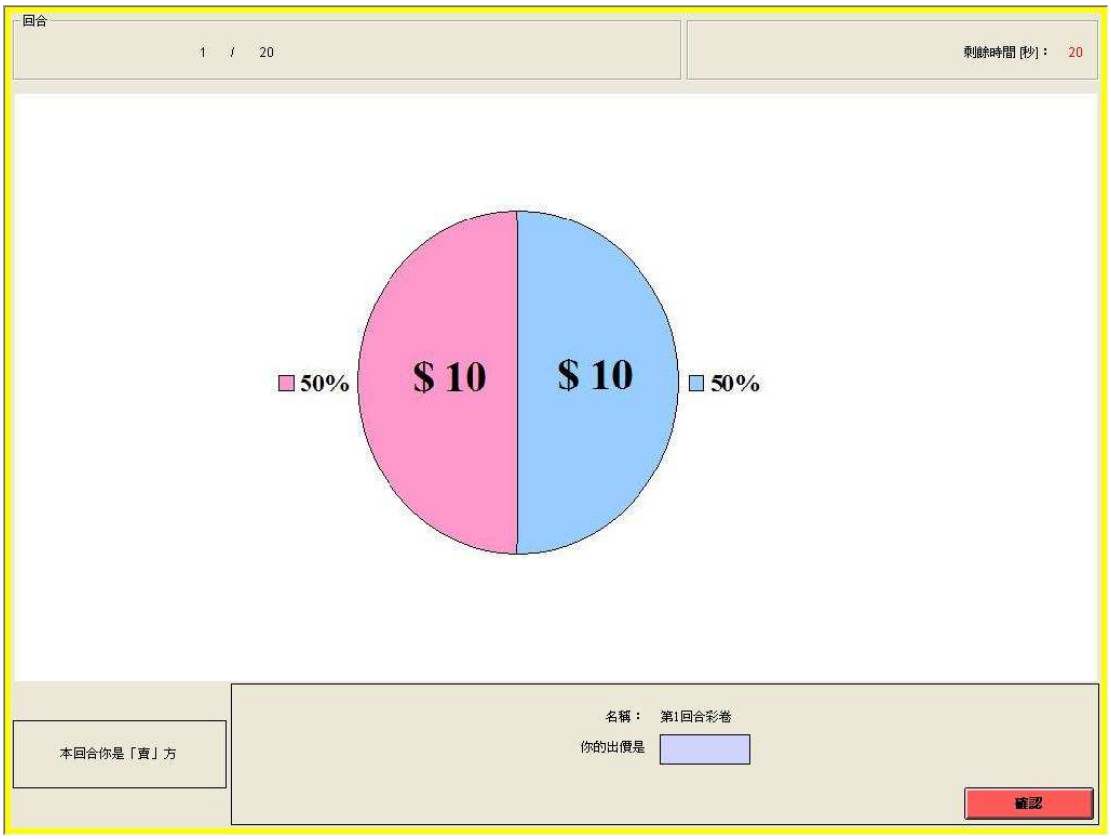

Figure S1: Screenshot for Paid Practice Round 1 (Lottery)

Figure S2: Screenshot for Paid Practice Round 15 (Mug, WTA)

Figure S3: Screenshot for Paid Practice Round 17 (Travel Mug, WTP)

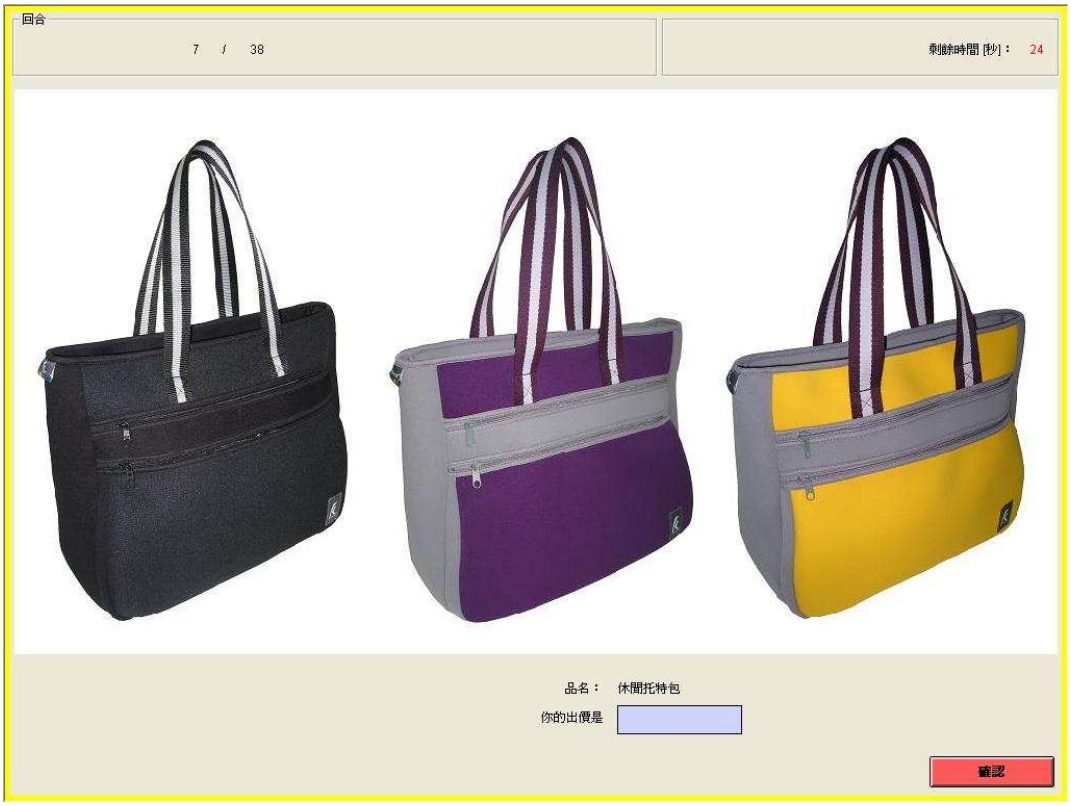

Figure S4: Screenshot for Eliciting WTP Before Seeing Price Tag (Tote Bag)

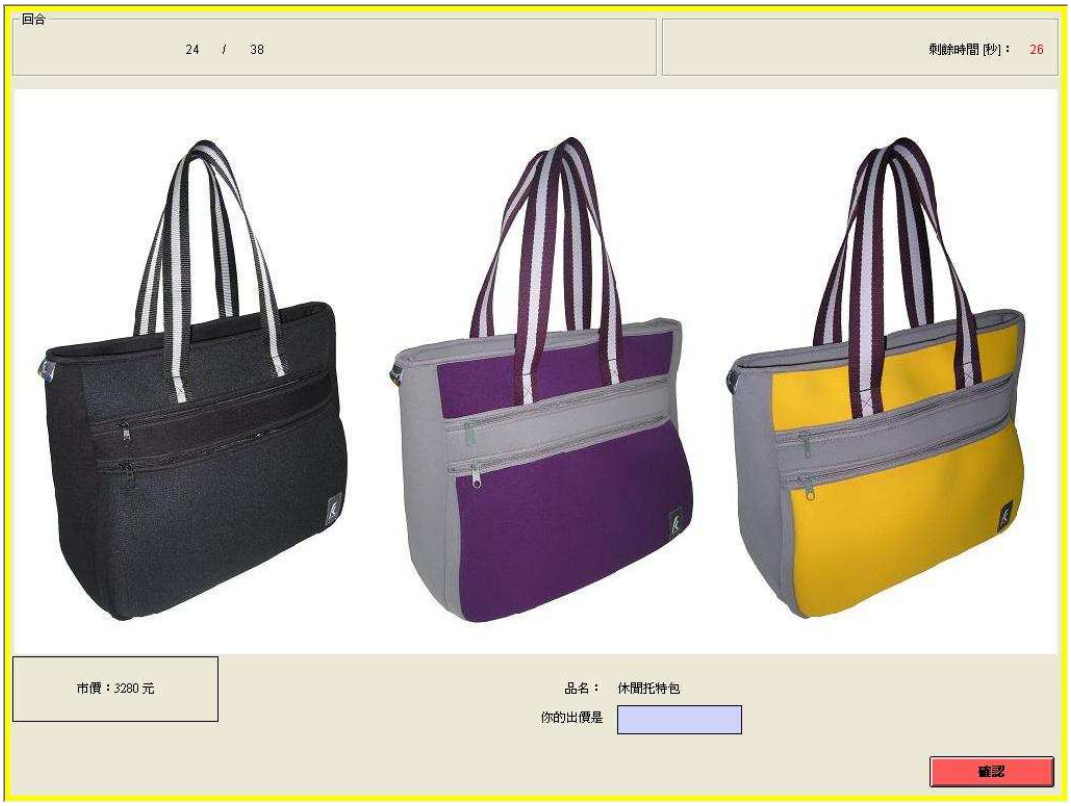

Figure S5: Screenshot for Eliciting WTP After Seeing Price Tag (Tote Bag)

Table S3- OLS and Random Effect GLS Regressions

Y= $WTP_{af} - WTP_{bf}$	**OLS 1**	**OLS 2**	**GLS 1**	**GLS 2**	**GLS 3**	**GLS 4**
Price – WTP_{bf} (Group 1)	0.0244**	0.0157	0.0337***	0.0299***	-0.0012	0.0007
	(0.00914)	(0.00930)	(0.00842)	(0.00857)	(0.0144)	(0.0144)
Price – WTP_{bf} (Group 2)	1.573***	1.607***	1.797***	1.819***	1.891***	1.878***
	(0.133)	(0.150)	(0.124)	(0.143)	(0.126)	(0.144)
Inexperience Dummy	40.11	152.5***	88.02***	131.4***		
	(21.85)	(30.17)	(24.61)	(27.39)		
NewProduct[2]					99.89***	97.54**
					(38.67)	(38.88)
NewProduct (Field)					81.43**	81.56**
					(33.64)	(33.77)
Age (Lab)		-17.42		-18.37		-16.94
		(13.00)		(23.21)		(23.17)
Age (Field)		5.188***		5.433*		5.077**
		(1.418)		(2.525)		(2.524)
Gender (Lab)[3]		0.770		1.757		1.669
		(25.52)		(45.58)		(45.49)
Gender (Field)		55.71*		54.22		52.80
		(25.57)		(45.63)		(45.55)
Disp. Income (Lab)[4]		4.77		4.69		0.00465
		(4.66)		(8.32)		(0.00830)
Disp. Income (Field)		3.96*		3.71		0.00386
		(1.73)		(3.08)		(0.00308)
Favorite (Group 1)[5]		-6.365		-12.87		-18.35
		(39.17)		(35.44)		(35.40)
Favorite (Group 2)		-78.74		-7.394		-11.47
		(136.2)		(125.7)		(125.3)
Paid Practice Payoffs		0.0271		0.0283		0.0265
		(0.0168)		(0.0299)		(0.0299)
Subject Pool (Field)[6]		-461.2		-493.2	5.855	-575.4
		(276.6)		(492.5)	(34.19)	(491.5)
Constant	14.90	186.7	-27.02	207.2	22.99	317.3
	(16.52)	(268.1)	(21.97)	(477.0)	(25.11)	(475.5)
Observations	918	918	918	918	918	918
R-squared	0.159	0.215				
Number of subject			54	54	54	54

Note:
1. Significance level: * = 5%, ** = 1%, *** = 0.1%.
2. NewProduct Dummy: Item 12-17 = 1; Item 1-11 = 0.
3. Gender Dummy: Female = 1; Male = 0.
4. Disposable Income: Per unit with NT$1,000 of disposable income.
5. Favorite Dummy: The item that is the subject's favorite = 1; Otherwise = 0.
6. Subject Pool Dummy: Field = 1; Lab = 0.